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DMS DATA TRANSFER UTILITY PROGRAM

VERSION 1.0

USER'S MANUAL

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SECTION 1
GENERAL INFORMATION

1.1 WHAT IS THE DMS DATA TRANSFER UTILITY PROGRAM?

The DMS Data Transfer utility software is an IBM PC compatible computer program. Through an RS-232 communication link with Krautkramer Branson's model DMS ultrasonic a-scan thickness gauge, the software allows thickness data and display images to be read onto a PC's disk.

DMS thickness data (text) may be viewed on the PC screen or printed to virtually any printer connected to the PC's parallel printer port. Graphic images may be printed to printers which support the EPSON graphics format and to printers which are compatible to the Hewlett Packard LaserJet series (II, III).

DMS thickness data files may be converted to the format required by Krautkramer Branson's Datamate™ II and III data management programs. Be sure to read the special limitations outlined in section 5.5 on Datamate™ file conversion.

1.2 GENERAL OPERATION

The DMS Data Transfer utility software uses a simple menu driven operating format. Menus listing the available functions are presented. The functions are activated by pressing the indicated function key (F1, F2, etc).

1.3 HARDWARE REQUIREMENTS

Krautkramer Branson's model DMS ultrasonic thickness gauge with operating software revision D3 or later. DMS - DME/DL Serial PC Cable (022-505-516)

Computer hardware:

1. MS-DOS computer
2. 640 K Bytes RAM
3. Hard Disk
4. DOS 3.2 or later
5. EGA graphics card with a minimum of 256 K of video memory or VGA
6. Available RS-232 port
7. Printer port
8. HP Laserjet or Epson graphics compatible printer

SECTION 2
GETTING STARTED

2.1 HARD DRIVE INSTALLATION

The DMS Data Transfer utility program may be loaded onto the computer's hard disk in any sub-directory.

Recommended Installation

While the program may be placed in the same sub-directory which will eventually contain report data, it is recommended that the program be placed in a sub-directory which is in the computer's PATH parameter and the data stored in a separate directory. This facilitates better file management by making back-up of data more efficient.

The location of the data files is specified on the program's configuration screen.

The setup of the computer's PATH statement (in the AUTOEXEC.BAT file) will not be addressed in this manual. Seek the assistance of someone familiar with computer operation with this step.

Quick Installation

The following procedure will permit the quickest installation of the DMS Data Transfer utility program without concern for the PATH setting:

Assuming we are installing the program on the C: drive and the program disk is in the A: drive

Type this	To do this
MD C:\DMS<ENTER>	Create a directory called DMS
CD C:\DMS<ENTER>	Change to the new directory
COPY A:*.* C:\DMS	Copy the program to the hard drive

2.2 STARTING THE PROGRAM

If the program was installed in a directory which is on the PATH, it can be started from any directory by typing: DMS <ENTER>

If the program was installed as described in the "Quick Installation", you will need to change to the correct directory first:

CD \DMS <ENTER>
DMS <ENTER>

2.3 SYSTEM SETUP SCREEN

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The system setup screen is accessed by pressing **F6 System Setup** from the main screen.

The parameters on the configuration screen may be changed at any time to control operation of the program.

To use the settings temporarily, exit the setup screen by pressing F7. To make the changes permanent, return to the main menu by pressing F10.

```
                        S Y S T E M
                    C O N F I G U R A T I O N

  Location of Data Files: C:\DMS\DATA\
                          Enter the drive and path location for
                          the thickness data files.
                          Leaving this line blank will cause the system to
                          store data in the default drive and directory.

                                    Printer Port  (1, 2, or 3): 1

                                       COM Port  (1, 2, or 3): 1

                          Baud (300,600,1200,2400,4800,9600,19200) 9600
     Set the DMS to this setting with 8 DATA BITS and NO PARITY.
                                                   Color (Y/N): Y

                                     Printer (Laser or Epson)  L

                           Language Translation File (? for list): ENGLISH.LAN
                        Date Format (1=MM/DD/YYYY  2=DD/MM/YYYY): 1
                             Time Format (1=12 hour  2=24 hour): 1

          Press ESC to cancel, F7 to use these settings, F10 to save settings
```

DATA DIRECTORY

If your data is to be stored in a sub-directory other than the default directory, you will need to specify this location by entering the full path name in the space provided.

If the data directory will always be the default, you may leave this field blank.

To specify the DATA DIRECTORY:

Press F6 from the main menu.

Using the UP and DOWN keys, place the cursor in the field labeled "Location of Data Files".

Enter the name of the directory where you wish to have the data files saved.

If the directory does not exist, you will be informed of this and asked if you wish to create a new directory.

PRINTER PORT

Printed reports may be directed to LPT1, LPT2, or LPT3.

COM PORT

This is the RS-232 port (asychronous communication port) to which the DMS is connected. If you are using a COM port other than COM1, you must specify which port you are using prior to operating the program with the DMS. Move the cursor to the COM Port field and enter a 1 or 2 corresponding to the RS-232 port to be used.

BAUD

The DMS's RS-232 parameters must be set to match the baud setting in this field. The DMS's default setting is 9600 Baud. In the DMS, DATA BITS must be set to 8, PARITY NONE.

COLOR

Selects use of colors or white on black background. By starting the program with the word BRIGHT (DMS BRIGHT), all text will be displayed as bright white as opposed to the two tone white. This will improve visibility on some LCD screens.

PRINTER TYPE

Reports may be printed to dot matrix printers which emulate the EPSON graphics format or to printers compatible to the HP LaserJet series.

LANGUAGE FILE

This is the name of the file which contains all of the text presented on the monitor during operation of the program.

DATE and TIME FORMAT

These settings control the time format (12 or 24 hour) and the date format (MM/DD/YYYY or DD/MM/YYYY).

SECTION 3
READING REPORTS and DATA

Reading any of the various formats of data from the DMS into the PC is accomplished by pressing **F1) Receive Data from DMS** from the main screen.

There are two options of DMS-to-PC data transfer:

F1) READ SELECTED DATA FILES

This option reads the DMS data recorder directory and presents this list on the PC screen. The operator may then place the cursor (using the UP/DOWN keys on the computer) on the file which is to be downloaded (transferred to the PC) and press F10 to initiate the download process. Alternatively, the operator may select several or all of the DMS files (by pressing the SPACE key) and press F10 to initiate the download process. To cancel selection of a file marked in error, return the cursor to file in question and press the SPACE key again.

The operator is prompted for a DOS extension to use with the file or group of files which are about to be downloaded. This gives the operator the ability to categorize files into easily managed groups. Note that files may be recalled and given new names using the File Utilities (F5 from the main menu) described in section 5.

A separate DOS file is created for each DMS file. DOS file names are created by taking the first six characters from the DMS file name which are acceptable to DOS and adding a two number addendum. The two number addendum (beginning with 00, 01, 02, etc) is selected which provides an unused DOS file name using the three letter extension provided above. After the 99th file, another letter is dropped to allow the use of the numeric addendum 100 - 999. Files must be renamed, moved to another disk, or a new file extension used before accumulating more that 999 files in a series.

IMPORTANT: Keep in mind when naming DMS files that only the first six letters are relevant to creating a DOS file name. If a DMS contains two files named VESSEL 200 and VESSEL 400, using the default extension DMS, these files will be written to separate DOS files named VESSEL01.DMS and VESSEL02.DMS respectively.

F3) READ REPORTS SENT BY DMS SEND

This option prompts the operator for a complete DOS file name and waits for the operator to press the DMS's SEND key. The operator will be warned if the DOS file name already exists.

The type of data sent is first selected by the operator under the DMS's RS-232 menu by setting the SEND parameter to the desired type of output (HARDCOPY, which is the display image at the moment the SEND key is pressed, or DISP+PDUMP, which is the display and the list of current operating parameters for the instrument).

Reports may also be initiated from the DR REPORT menu. These reports include such listings as a data recorder file directory and master comment list.

Note: It is recommended that you NOT use this function to read reports from the DMS, especially not the SEND ALL command, since this would put all of the DMS files into one DOS file.

CANCELLATION OF TRANSFERS

The transfer process may be canceled by the operator by pressing the ESCAPE key on the computer.

SECTION 4
REVIEWING DATA FILES

4.1 SELECTING FILES

Reviewing reports and graphic screen images saved on disk is accomplished by pressing **F3) Review Data** from the main screen.

The operator will be allowed to enter a DOS file specification in order to limit the number of files to a specific group. For example: TANK*.* will present only the files which begin with TANK, *.OCT will present only the files which have the extension OCT.

NOTE: The files presented will be selected from the DATA DIRECTORY as specified on the System Configuration Screen (accessed by pressing F6 from the main menu).

The VIEW SCREEN presents the list of files in the data directory which meet the file specification.

Using the Up/Down arrow keys on the computer, select the file of interest. In the case of a standard thickness data file, the file header and status information is shown on the right half of the screen. Other types of files will be identified as to whether they are hardcopy graphics (of the DMS display), DMS comment listings, etc.

To view the actual data or graphic image, press the ENTER key as indicated at the bottom of the screen.

4.2 VIEWING and EDITING DATA

Press the Up/Down and PageUp/PageDown key to move through the data file.

FILE HEADER

At any time while viewing the file, press "C" to refer to the Comment legend. Similarly, pressing the "H" key will present the file header information. Certain parameters in the header my be edited by pressing "E".

Changes made to T-Min and T-Max are immediately reflected on the screen by the "less than" (<) and "greater than" (>) symbols.

The changes may be used for the current viewing only or written permanently to the file by press F7 or F10 respectively.

> NOTE: Changes made to the LOSS and GROWTH fields are NOT reflected by the flags in the currently viewed file since these are flags that are set at the moment the readings are taken.
>
> Krautkramer Branson's DMS MATE™ provides the ability to send data files back to the DMS. This permits the operator to compare old and new readings during the recording process. New readings which exceed the limits for LOSS and GROWTH, as set in the header, are flagged.

FILE STATUS

The file status is displayed by pressing the "S" key. This is a dynamic calculation which may take several seconds when viewing large files on slower computers.

The file status scans the file, counting the number of readings below T-Min, above T-Max, determines the thinnest value, thickest value, number of a-scans stored, number of thickness readings stored, number of empty points, number of obstructed points, etc.

SECTION 5
FILE UTILITIES

All of the functions under FILE UTILITIES (F5 from the main menu) begin with the selection of the file to be acted upon. Some of the functions allow multiple files to be selected, while others are restricted to operating on one file at a time.

To facilitate positive identification of data files, all of the features available in the REVIEW DATA function are available here, during the file selection step. That is, you may view the header and status information and, by pressing the ENTER key, you may review the actual data file.

5.1 PRINT

This function allows the operator to choose one or more files for printing to the printer type indicated in the SYSTEM SET UP screen (F6 main menu).

NOTE: If you print to an HP Laserjet with the DMS MATE software configured for an EPSON printer, you will waste many pages of paper with a few meaningless characters on each page.

No matter what type printer is selected at the DMS, the Laser printer or Epson format may be selected and used to print from the PC.

5.2 CONVERT DATA FILES TO DATAMATE™

This function allows the operator to convert DMS data files to the format required by Krautkramer Branson's Datamate™ II and III data management programs. These programs require that the DOS extension be "DAT". The default name for the new Datamate™ file will be the same as the file being converted with the extension changed to "DAT".

This function creates a new file with the original file unaffected.

The operator is prompted for the drive and path first and the actual name of the Datamate™ file separately. This is because a Datamate™ file includes the DOS file name within its header and there is no need for, nor is there room for, a drive and path with the file name. Enter ONLY the eight letter DOS file name WITH a period and the required DAT extension in the Datamate™ file name prompt window.

The destination is taken literally. That is, if you simply enter a file name, the file is copied to the default directory using that name, NOT to the data directory which may be specified in the System Set Up. For this reason, the current default directory is shown.

```
Drive and Path for Datamate Files:
C:\DMS\
Entry optional - Leave blank to store file in
default directory.  Enter ONLY a drive and/or
path designation - Do not enter the file name here.
```

```
C:\DMS\DATA2\HEADER01.DMS
File size:        5,479
Current Default Directory is:
C:\DMS

Datamate File Name:
HEADER01.DAT
Datamate files must use the extension  .DAT
```

Since Datamate™ II & III were designed to work with instrumentation whose capacity was considerably less than the DMS, it is possible to create DMS files which exceed the capacity of these versions of Datamate™. To maintain compatibility with Datamate™, you should avoid creating files greater than 14,000 bytes where each location name uses 17 bytes and each reading takes up 2 bytes.

The following information appears on the screen when the Datamate™ Conversion function is accessed. The recommended file sizes given here follow the above formula.

```
C O N V E R T  to  D A T A M A T E

Advice on the use of the DMS with Datamate II & III

Special consideration must be given to the fact that the DMS is capable of
creating files which exceed the capacity Datamate II & III.

To maintain compatibility with Datamate II & III, avoid creating files which
exceed the following limits:

If the number of Locations is        Max number of Readings per location is
                20                    341
                50                    131
                80                    79
                110                   55
                140                   41
                170                   32
                200                   26

                Press Any Key to Continue
```

5.3 CONVERT GRAPHICS TO PCX FORMAT

After prompting the operator for a DOS file name, a PCX file of the selected graphic image is written. The default name is the same name as the selected file with the extension PCX added. While any extension may be used, most word processing software requires the PCX extension to recognize that the file is a PCX format file.

To perform the conversion, the image is first drawn on the screen. A percentage indicator will inform the operator of the progress of the conversion.

When entering the file name, it is advisable to enter the drive and path designation which will place the PCX file in the subdirectory where your word processing program expects to find graphics files.

Using Word Perfect, PCX files may be brought into a document using the ALT-F9 GRAPHICS command. Refer to the operating manual of your word processing program for specific details.

5.4 EXPORTING DATA - ASCII DELIMITED FORMAT

This export function provides output in two formats. In both cases, the data is written with fixed field lengths.

SPREADSHEET

The spreadsheet format outputs location names in quotation marks, separated by a space, with the thickness reading unquoted. Thickness points marked "obstruct" or "empty" are written as 0 (zero).

A Custom-Linear file with 2 locations named NORTH LOOP and EAST LOOP with 2 points at each location would export as:

```
"NORTH LOOP      " "1" 0.325
"NORTH LOOP      " "2" 0.321
"EAST LOOP       " "1" 0.301
"EAST LOOP       " "2" 0.303
```

DATABASE

The database format separates the fields with a comma. The thickness readings are also quoted and include the unit of measure. Empties and obstructs are indicated as such.

A Custom-Linear file with 3 locations named NORTH LOOP, SOUTH LOOP and EAST LOOP with 2 points at each location would export as:

```
"NORTH LOOP      ","1","0.325 in"
"NORTH LOOP      ","2","0.321 in"
"SOUTH LOOP      ","1","EMPTY   "
"SOUTH LOOP      ","2","OBSTR   "
"EAST LOOP       ","1","0.301 in"
"EAST LOOP       ","2","0.303 in"
```

APPENDIX A

RECOMMENDATIONS ABOUT BACKUPS & OPERATING PRACTICES:

Your procedures for keeping backups should reflect the value of your data. There should be no question that one day your hard disk will not boot or a data file will be unreadable. When this happens, instead of counting on extreme measures to repair the drive, you should simply use a backup copy.

Never place your last copy of valuable data into a drive which is questionable. A defective drive CAN erase data from a disk even if the write-protect notch is in the read-only position.

Two copies of a collection of data (other than the hard disk) should be considered marginally adequate. Three additional copies kept at different locations is a more prudent practice.

One of the greatest errors in even the most careful backup procedures is the reuse of the same disks to copy updated subdirectories. If a file which exists on a backup disk becomes damaged on the hard disk and this damage goes undetected, the next backup attempt will render the copy which resides on the backup disk unreadable also.

NEVER ERASE - Floppy disks are CHEAP. Never erase data (especially in the heat of battle) under the belief that you transferred data from the DMS to the PC twice. Move files of questionable value to a floppy. Remember that no matter what you name a DMS DOS file (JUNK1.BAK), the DMS file name still resides inside the file and the file remains readable by the DMS MATE software, with the information about the date and time it was last modified.

A DANGEROUS FEATURE OF DOS

If you are moving files from one area (subdirectory) of a hard disk to another, there is a phenomenon which you should know about. If you type a command to COPY all of the files in the default directory to another directory called, for example, BACKUPS, you would type, at the DOS prompt:

```
COPY  *.*  \BACKUPS
```

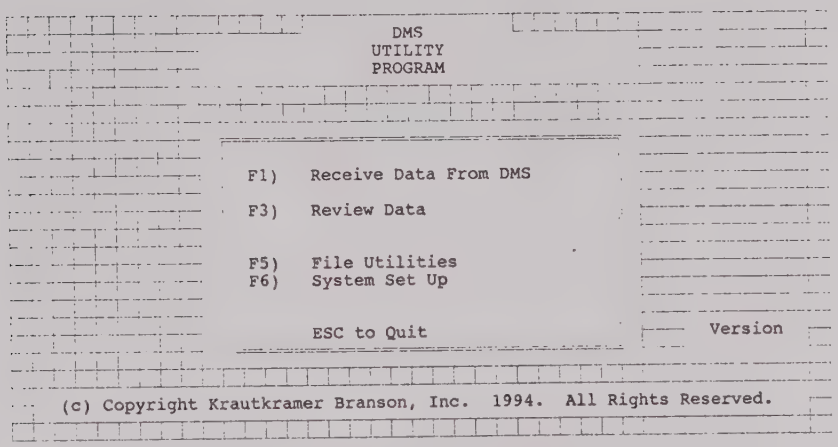
You would then see a message that X file(s) were copied.

The problem arises if you make a typographical error and instead of typing the above, you type:

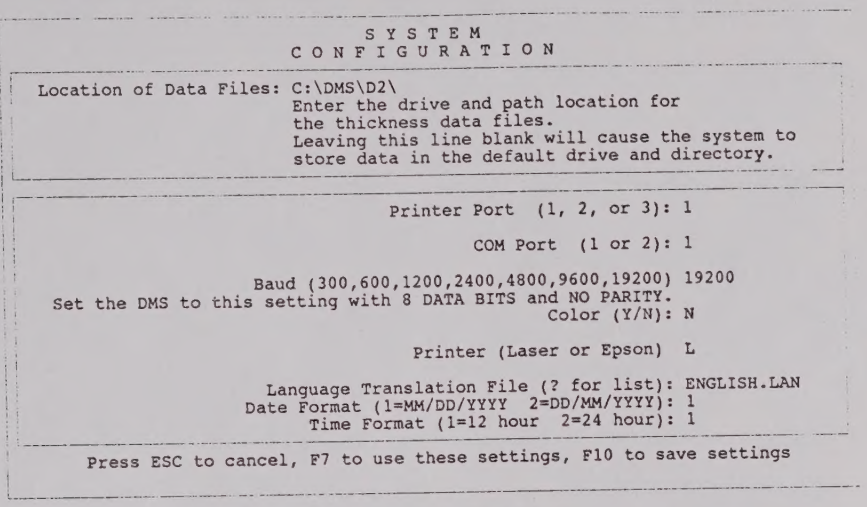
```
COPY  *.*  \BACKOOPS
```

You will get the same "Files Copied" message and think all is well - but, what happens is that DOS copies all of the files into ONE file in the root directory called BACKOOPS

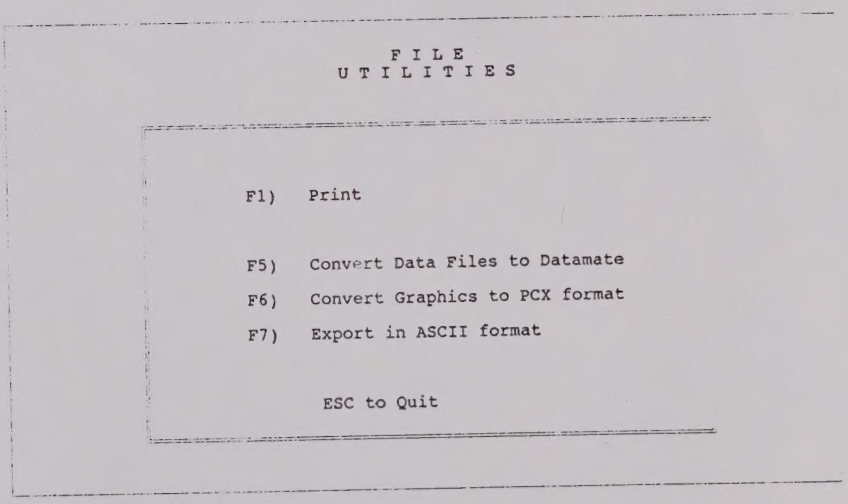
APPENDIX B



Main Menu Screen


S Y S T E M
C O N F I G U R A T I O N
Location of Data Files: C:\DMS\D2\
Enter the drive and path location for
the thickness data files.
Leaving this line blank will cause the system to
store data in the default drive and directory.
Printer Port (1, 2, or 3): 1
COM Port (1 or 2): 1
Baud (300,600,1200,2400,4800,9600,19200) 19200
Set the DMS to this setting with 8 DATA BITS and NO PARITY.
Color (Y/N): N
Printer (Laser or Epson) L
Language Translation File (? for list): ENGLISH.LAN
Date Format (1=MM/DD/YYYY 2=DD/MM/YYYY): 1
Time Format (1=12 hour 2=24 hour): 1
Press ESC to cancel, F7 to use these settings, F10 to save settings

Configuration Screen


F I L E
U T I L I T I E S
F1) Print
F5) Convert Data Files to Datamate
F6) Convert Graphics to PCX format
F7) Export in ASCII format
ESC to Quit

File Utilities Screen

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